All District Engineers

Michael L. Hine

Special Provision for Railroad, Full-Actuated Controller and Cabinet

January 9, 2004

This special provision was developed by the Bureau of Operations in cooperation with the Illinois Commerce Commission. It should be inserted into all contracts when traffic signals near highway-rail grade crossings are to be interconnected to the crossings warning devices.

The districts should include the BDE Check Sheet marked with the applicable special provisions for the April 23, 2004 and subsequent lettings. The Project Development and Implementation Section will include the paper copy in the contract.

This special provision will be available on the transfer directory January 9, 2004.

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RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET (BDE)

Effective: April 1, 2004

Description. Work shall be according to Section 857 of the Standard Specifications except as modified herein.

Revise the first sentence of the first paragraph of Article 857.04 of the Standard Specifications to read:

"This work will be paid for at the contract unit price each for FULL-ACTUATED CONTROLLER AND CABINET or RAILROAD, FULL-ACTUATED CONTROLLER AND CABINET of the type specified, which price shall include the conflict monitor, load switches and flasher relays."

Add the following paragraph after the first paragraph of Article 1073.01(c)(2) of the Standard Specifications:

"Railroad interconnected controllers shall provide for immediate track clearance green re-service upon receipt of each subsequent pre-empt demand. During this re-service all normal vehicle clearance intervals, including red revert, shall be respected. Pedestrian clearance during railroad pre-emption will be limited to a flashing don't walk interval in length to the vehicle yellow clearance interval and shall time concurrently with the yellow clearance."

Add the following to Article 1074.03(a)(5) of the Standard Specifications:

"e. Railroad Interconnection. Railroad interconnected controllers and cabinets shall be fully tested and approved in the equipment suppliers facility prior to field installation. Three copies of the complete cabinet wiring showing all connections including railroad interconnect circuit shall be furnished.

Cabinets shall be equipped with a labeled test switch for the railroad interconnected pre-emption line which shall place a call in the controllers railroad pre-emption routine and also shall acknowledge power to the interconnect line. The switch shall resume to normal position upon release.

The terminal facility shall be wired so as to provide supervision of all essential pre-emption components. This wiring shall cause the facility to transfer to or remain in flashing operation in the event any critical component is missing, not connected or failed. The preemption interface relay shall be wired so as to be in the energized state during normal (non-pre-empt) operation. Each critical element such as controller harnesses and interface relays shall be wired to form a series loop which must be complete for normal operation.

A method of supervising the individually shielded three pair cable or individually braided three conductor cable, interconnecting the traffic and railroad facilities shall provide flashing operation during failed cable conditions. Upon detection of a failed railroad interconnect the controller shall provide one track clearance green interval and shall enter flashing operation at the end of track clearance red interval. Such flashing operation shall be manually reset. The supervision circuit shall be capable of detecting failure of the supervision circuit components themselves, and shall provide fail-safe operation upon such failure.

The interconnect to the railroad facility shall be such that demand for pre-emption begins when the railroad flasher begin to flash and ends when railroad gates begin to rise.

A Department approved method of controller security shall be implemented to assure data integrity and to preclude changes to critical data. The method shall include a means for the controller to continuously verify controller/cabinet Cyclical Redundancy Check (CRC) or Terminal and Facility (T&F) Signature match. The CRC or T&F Signature shall be developed based on preemptor entries, unit data (including phases in use, sequence and ring structure, etc.), overlap assignment and timing, firmware version, and any special memory content necessary to proper operation. Where data is stored in a data module or on a computer chip, a spare data module or computer chip shall be provided to the Engineer."

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